CLAIMS

1. A method of operating an emission abatement assembly, the method comprising the steps of:

determining if regeneration of a first DPNR device is to be performed and generating a first regenerate-DPNR signal in response thereto, and

operating a fuel reformer so as to produce and advance reformate gas to the first DPNR device in response to generation of the first regenerate-DPNR signal.

2. The method of claim 1, further comprising the steps of:

determining if regeneration of a second DPNR device is to be performed and generating a second regenerate-DPNR signal in response thereto, and

operating the fuel reformer so as to produce and advance reformate gas to the second DPNR device in response to generation of the second regenerate-DPNR signal.

3. The method of claim 2, further comprising the steps of:

positioning a diverter valve in a first valve position so as to direct reformate gas to the first DPNR device in response to generation of the first regenerate-DPNR signal, and

positioning the diverter valve in a second valve position so as to direct reformate gas to the second DPNR device in response to generation of the second regenerate-DPNR signal.

4. The method of claim 2, further comprising the steps of:

positioning a diverter valve in a first valve position so as to reduce a flow of exhaust gas through the first DPNR device in response to generation of the first regenerate-DPNR signal, and

positioning the diverter valve in a second valve position so as to reduce the flow of exhaust gas through the second DPNR device in response to generation of the second regenerate-DPNR signal.

5. The method of claim 1, further comprising the step of advancing exhaust gases from an internal combustion engine through the first DPNR device, wherein the determining step is performed contemporaneously with the exhaust gases advancing step.

6. The method of claim 1, wherein the step of determining if regeneration of the first DPNR device is to be performed comprises sensing the amount of NO_X in a flow of exhaust gas.

7. The method of claim 1, wherein the step of determining if regeneration of the first DPNR device is to be performed comprises sensing a pressure drop across the first DPNR device.

8. The method of claim 1, wherein the step of determining if regeneration of the first DPNR device is to be performed comprises determining if a predetermined period of time has elapsed since the first DPNR device was last regenerated.

9. The method of claim 1, wherein the step of determining if regeneration of the first DPNR device is to be performed comprises determining an amount of NO_X produced by an internal combustion engine since the first DPNR device was last regenerated.

10. An emission abatement assembly, comprising:

a first DPNR device having a gas inlet,

a fuel reformer having a gas outlet fluidly coupled to the gas inlet of the first DPNR device, and

an electronic control unit electrically coupled to the fuel reformer, the electronic control unit comprising (i) a processor, and (ii) a memory device electrically coupled to the processor, the memory device having stored therein a plurality of instructions which, when executed by the processor, causes the processor to:

(a) determine if regeneration of the first DPNR device is to be performed and generate a first regenerate-DPNR signal in response thereto, and

(b) operate the fuel reformer so as to produce and advance reformate gas to the gas inlet of the first DPNR device in response to generation of the first regenerate-DPNR signal.

11. The emission abatement assembly of claim 10, further comprising a second DPNR device having a gas inlet, wherein:

the gas outlet of the fuel reformer is fluidly coupled to the gas inlet of the second DPNR device, and

the plurality of instructions, when executed by the processor, further cause the processor to (a) determine if regeneration of the second DPNR device is to be performed and generate a second regenerate-DPNR signal in response thereto, and (b) operate the fuel reformer so as to produce and advance reformate gas to the gas inlet of the second DPNR device in response to generation of the second regenerate-DPNR signal.

12. The emission abatement assembly of claim 11, further comprising a diverter valve electrically coupled to the electronic control unit, wherein:

the diverter valve is fluidly coupled to (i) the gas inlet of the first DPNR device, (ii) the gas inlet of the second DPNR device, and (iii) the gas outlet of the fuel reformer, and

the plurality of instructions, when executed by the processor, further cause the processor to (a) position the diverter valve in a first valve position so as to direct reformate gas to the gas inlet of the first DPNR device in response to generation of the first regenerate-DPNR signal, and (b) position the diverter valve in a second valve position so as to direct reformate gas to the gas inlet of the second DPNR device in response to generation of the second regenerate-DPNR signal.

13. The emission abatement assembly of claim 10, further comprising a NO_X sensor configured to sense the amount of NO_X in a flow of exhaust gas, wherein the plurality of instructions, when executed by the processor, further cause the processor to determine if regeneration of the first DPNR device is to be performed based on output from the NO_X sensor.

14. The emission abatement assembly of claim 10, further comprising a pressure sensor configured to sense a pressure drop across the first DPNR device, wherein the plurality of instructions, when executed by the processor, further cause the processor to determine if regeneration of the first DPNR device is to be performed based on output from the pressure sensor.

15. The emission abatement assembly of claim 10, wherein the plurality of instructions, when executed by the processor, further cause the processor to generate the first regenerate-DPNR signal if a predetermined period of time has elapsed since the first DPNR device was last regenerated.

16. An emission abatement assembly, comprising:

a first DPNR device for removing NO_X and particulate soot from an exhaust gas of an internal combustion engine, and

a plasma fuel reformer for reforming a hydrocarbon fuel into a reformate gas, the plasma fuel reformer being fluidly coupled to the DPNR device.

17. The emission abatement assembly of claim 16, further comprising a second DPNR device fluidly coupled to the plasma fuel reformer, the first DPNR device and the second DPNR device being arranged in separate parallel flow paths.

18. The emission abatement assembly of claim 17, further comprising:

flow diverter valve fluidly coupled to the first DPNR device, the second DPNR device, and the plasma fuel reformer, the flow diverter valve being operable to divert reformate gas from the plasma fuel reformer between the first DPNR device and the second DPNR device.

19. The emission abatement assembly of claim 18, further comprising an electronic control unit electrically coupled to the plasma fuel reformer and the flow diverter valve, the electronic control unit being configured to control operation of both the plasma fuel reformer and the flow diverter valve so as to (i) advance reformate gas from the plasma fuel reformer to the first DPNR device during a first period of time, and (ii) advance reformate gas from the plasma fuel reformer to the second DPNR device during a second period of time.